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SCIENCE

FRIDAY, JULY 2, 1920

CONTENTS

The Founding of the Wisconsin Academy of Sciences, Arts and Letters: PROFESSOR THOMAS CHROWDER CHAMBERLIN 1

Scientific Events:—

Aitoff's Equal-area Projection of the Sphere; Retirement of Civil Service Employees; The Mayer Memorial Medal; Honorary Degrees at Yale University 8

Scientific Notes and News 10

University and Educational News 13

Discussion and Correspondence:—

Orthogenesis among Fishes: DR. DAVID STARR JORDAN. Einstein's Theory and Shift of Spectrum Lines: DR. ELIZABETH R. LAIRD. Anopheles Larvae in Salt Water: DR. JAMES ZETEK 13

Quotations:—

The Lister Institute 15

Scientific Books:—

Pasteur, the History of a Mind: PROFESSOR L. R. JONES 15

Notes on Meteorology:—

The Distribution of Maximum Floods; Notes: DR. C. LEROY MEISINGER 17

Special Articles:—

A Simple Method for Titrating Electro-metrically to a Desired End Point in Acid Alkaline Reactions: DR. PAUL E. KLOPSTEG 18

The American Society of Mammalogists: DR. HARTLEY H. T. JACKSON 19

THE FOUNDING OF THE WISCONSIN ACADEMY OF SCIENCES, ARTS AND LETTERS

THE event we are met to commemorate was a quiet one in itself. It took place without noise or pageantry. But none the less, in the intellectual history of the people of this commonwealth, it was a signal event. The founding of the Wisconsin Academy of Sciences, Arts and Letters, though quite without the paraphernalia of a great event, was yet a most distinctive step in the passage from the first stage in the intellectual evolution of our people into this, the second stage.

The first stage, it is needless to say, was that of pioneer development. It began with the coming of our forefathers into this goodly land between the Great Lake and the Great River. The territory was then in its virgin state, tenanted by the wild life that had taken possession of it on the retreat of the Great Ice Invasion. This first stage was a period of pioneer struggle and this struggle almost necessarily delayed certain forms of scientific and cultural development. This pioneer stage continued not only until the virgin prairies, the wild meadows, the park-like groves, and the trackless forests of Wisconsin had been replaced by cultivated fields, comfortable dwellings and prosperous towns, but until all these had been bound together by a network of roadways and railways that united the whole into an intercommunicating co-operative community ready to enter upon a common organized career in pursuit of its higher interests.

The second stage could really begin only

when the conditions were thus ripe for unified efforts to develop the higher intellectual, ethical and esthetic interests of the community. I think you will agree with me that no step toward this higher evolution could be more fundamental than the beginning of a concerted endeavor to search out rigorously, to test and to make known the basal truths that conditioned the lives of the Wisconsin people: our habitat, the native life of the land, our material inheritances, our climatic and other physical surroundings, our social and moral conditions, our political institutions, as well as the arts and the literatures that made it possible to use these most effectually. I do not think that the partiality of the occasion leads us beyond the realities, when we regard the founding of the academy as at least the most representative step in this new development. It was of course by no means the only step, nor was it the pioneer step in the transition from primitive conditions to the more mature civilization to which the state has since attained; for, in addition to the effective work of the schools and the churches, which had taken on broader aspects and become more efficient as the passing of primitive conditions permitted, the State Historical Society, the State Agricultural Society, the State Teachers' Association, and other organizations had already taken up their special tasks and had become effective agencies of progress; but, none the less, the founding of the academy was the most representative event in the turn to the new order of things, for, better than any other single event, it typified the coming of a higher order of endeavor, in that its distinctive feature was cooperative research for the common good, and this, I think you will agree, is the most basal and truest index of real progress.

The movement furthermore was a comprehensive one, and altruistic; it was unrelated to special interests. It was entered upon spontaneously in full realization of the sacrificial labors that would be necessary to make the enterprise a real success. And so, in its high purpose and in its sacrificial spirit, this coming together, fifty years ago, of good men from all parts of the state to found an academy whose chief purpose was to facilitate a concerted search for truth for the common good, stands forth as an altogether signal event in the intellectual development of our people.

THE PIONEER PREPARATORY STAGE

But before we pass on to review with gratitude and appreciation the work of the founders of the academy, let us pay a passing word of respect to the pioneers who paved the way for the later era. Let us also not altogether pass in silence the native conditions which became our inheritance and which contributed more than perhaps we realize to what Wisconsin now is and is likely to be.

To one who saw the primitive wildness of this region as it was vanishing and who played his little part in the early struggle to replace the unbroken sod with cultivated land, it is a pleasure to recall this early epoch and all that it meant to the founders of the state. The primitive wildness had a charm which no one who saw it can easily forget, and the struggle with this wildness, strenuous as it was, had in it such an imperative call for personal resourcefulness and such a toughening of physical and mental fiber as one would not wish to have escaped. It brought its hard lessons of self-dependence, of adaptation, of courage and of tenacity. It would be a pleasure to dwell at length upon the primitive aspects of Wisconsin clothed in the charm of its

untouched nativity, but I must confine myself to that one phase which stimulated some of the special intellectual activities which led up to the event we celebrate.

Virgin Wisconsin was a Paradise for the naturalist. Its situation gave it rare advantages. Its latitude placed it in the mid-zone of the teeming life that migrated annually between the high north and the genial south, while its longitude placed it in a peculiarly rich tract of that zone. The great lake on its eastern border served as a broad blunt wedge which parted the migrating host into two great divisions: on the one hand, the forest lovers who sought the wooded regions of the northeast in summer and the like regions of the southeast in winter; on the other hand, the prairie lovers who preferred the great open plains. Between these there was a middle zone and a middle host formed in part of the overlap of the two other hosts, but in part also of those species which distinctly preferred the border tract of "openings," the parks of interspersed prairie, meadow and woodland, lying between the great forests and the great plains. The southern and western part of Wisconsin was one of the most charming sections of this great border tract of natural parks. Through this parkway there swept northward each spring and southward each fall a mixed multitude of winged life that now, in its depleted state, seems really incredible. The great woods of the north and northeast, with Lake Superior in their rear, tended to shunt this host to the northwest and caused congestion on their front. If I were to try to tell you in specific terms of the richness and variety of life in springtime, as I remember it, I fear you would feel impelled to call into service the famous mot of Von Buch: "I am glad you saw that; for if I had seen it, I would not have believed it."

Out of the irresistible attractions of the native life of the air, the woodlands, the grove-encircled prairies, the meadows, the marshes, the limpid streams, and the charming lakes of Wisconsin, there grew the first notable stage of spontaneous scientific activity, the stage of the enthusiastic naturalist. It was quite in the natural order of things that where personal conditions favored, as among surveyors like Lapham and among doctors of wide country practise like Hoy, there should arise enthusiastic students of the rich fauna and the flora of the region, as also of the land that lay beneath and of the sky that hung overhead. This stage of naturalistic enthusiasm reached its climax somewhat before the general conditions in the state were ripe for the founding of the academy; and so the pioneer naturalists of Wisconsin, particularly Lapham and Hoy, may be regarded as the forefathers of the academy quite as truly as its founders. Though the naturalist stage had already somewhat declined when the time for the inauguration of the academy had come, it was a very essential preliminary to the founding of the academy.

THE IMMEDIATE PRE-PERIOD OF PREPARATION

The thirties, the forties and the early fifties of the last century were eminently pioneer days. With the sixties came the Civil War, and with the mid-sixties, its close. It left the natural aftermath of war, diverse currents and counter currents of thought and feeling setting in devious directions—on the one hand, a desire for peace and rest, for cessation of serious thought, for physical, mental and even moral relaxation; on the other hand, when these first desires were in some measure satisfied, a resumption of the tension that had become habitual in the war, a new impulse to tenacious pursuit, a new will to

victory. The larger vision that came with the wider interests and experiences of the war, visions of that which was national rather than personal, entered into the new mental attitude. The man whose pre-war thoughts had centered on his farm, his town, or his county, had been forced to dwell on his state and his country at large and he could not permanently shrink back to his former limitations of interest. The man who had marched shoulder to shoulder could not well relapse into personal isolation. And so the half decade following the war became the generative period of these broader views and those generous instincts of coordination that led to the organization of a common effort for the intellectual development of the state. This was the immediate pre-period of the founding of the academy.

THE FORMAL FOUNDING OF THE ACADEMY

During this half-decade, voluntary organizations were formed here and there for the promotion of science and for personal culture, and some futile efforts of a more general order were made, all of which were more or less tributary to the coming general movement. Encouraged by these symptoms of readiness, Dr. J. W. Hoyt, secretary of the State Agricultural Society, worked out a comprehensive scheme for a State Academy. He sent printed copies of this to such citizens of the state as were thought to be interested in such a movement, whether or not they were likely to be able to engage in research or to make contributions to any phase of science, arts, or letters. He also proposed that a convention be called to organize such an academy. The proposals met with a cordial response and a special call for the proposed convention was issued bearing the signatures of 105 representative men of various callings and intellectual interests. In explanation of

my presence here to-day and my effort to serve you as requested by your president, I may be permitted to say that my name formed the tail end of the list, and that is perhaps why "the rider of the pale horse" has thus far overlooked me in his frequent and fateful visitations. If he shall continue to feel that the vanishing end of the long list is too immaterial to require any notice on his part, his good judgment will meet with my most hearty concurrence.

The convention met on February 16, 1870, and proceeded with great unanimity to organize the Wisconsin Academy of Sciences, Arts and Letters. A constitution was adopted, officers elected, provision made for incorporation and for the other requirements of a new organization. The constitution provided for three departments, embracing respectively the sciences, the arts and letters. Only the first of these was organized at the initial meeting, but a fuller organization was effected during the ensuing year.

The general purpose of the academy was declared to be the encouragement of investigation and the dissemination of correct views of the various phases of science, literature and the arts. The special purposes of the Department of the Sciences were declared to be general scientific research, a progressive and thorough scientific survey of the state under the direction of the officers of the academy, the formation of a scientific museum, and the diffusion of knowledge by the publication of original contributions to science; that of the Department of Arts to be the advancement of the useful arts through the application of science and the encouragement of original invention; the encouragement of the fine arts and the improvement of the public taste by original contributions to art and by the formation of an art museum; that of

the Department of Letters to be the encouragement of philological and historical research, the improvement of the English language, the collection and preservation of historic records, and the formation of a general library.

Thus took place, fifty years ago, the formal founding of the academy.

THE SUBSTANTIAL ESTABLISHMENT OF THE ACADEMY

As already implied, this formal inauguration of the academy represented rather the ideals and aspirations of those who gave it countenance, than a substantial banding together of real workers in science or scholarship. It is unnecessary to say that the future of the academy as a vital working institution depended almost wholly upon the persistent and sacrificial endeavors of men personally devoted to research and to culture. Scarcely a dozen of those who signed the call for the convention were productive workers in any of the fields embraced within the purposes of the academy. The more comprehensive clientele sought for the academy at the outset was altogether laudable and the sympathy and encouragement of this larger body were very helpful, but I assume that you who now form the working members of the academy and are to hand it on to the next generation, care most to learn who were the real leaders in giving working vitality to the academy in those earliest days, all the more so because certain vital phases of this essential feature of the enterprise linger only in vanishing impressions and fading memories and will soon be lost if not now recorded.

The important part played by Dr. Hoyt in planning so broadly and in urging so successfully the initial steps, has already been indicated. This service was recognized by choosing him first president of the acad-

emy. He was thus enabled to round out the formal organization of the academy on the comprehensive plan adopted. He had the merit of assiduity in calling into activity the latent as well as active talent available in the state at the time. Though not a special worker in any line of research, his intellectual sympathies were wide, his aspirations were high; his dream for the academy was ambitious.

The working nucleus of the academy at the start was the group of enthusiastic naturalists who had grown up under the stimulus of the pioneer conditions. Among these I beg to include those who studied the strata beneath and the sky above, as well as those devoted to the plants and animals that tenanted the surface. Foremost among these, by common consent, was Dr. I. A. Lapham, of Milwaukee, then already a veteran scientist. By profession a civil engineer, he had become at an early day a faithful collector, observer and recorder of natural phenomena in nearly all leading lines from bed-rock to sky. He was at once a botanist, a zoologist, an archeologist, a geologist and a meteorologist. He was a distinguished example of the best order of the old school of all-round students of natural science. Probably we owe to Dr. Lapham, more than to any other single individual, the establishment of our Weather Service. He served as the first general secretary of the academy.

Scarcely less active and influential in giving vitality to the academy at the start was Dr. H. P. Hoy, of Racine, an intimate friend and coworker of Lapham's in early naturalistic work. He had already become a veteran student of birds, insects and fishes, and was also an enthusiastic collector of plants and of fossils from the ancient crinoid fields of Racine. He was also an eager student of the relics of aboriginal

life. Lapham was quiet and modestly demonstrative, but Dr. Hoy so bubbled over with enthusiasm that he easily set the pace in demonstrative interest. He was chosen as the second president of the academy. Dr. J. G. Knapp, of Madison, was a frequent contributor in several naturalistic lines, as was also Dr. Engelmann, of Milwaukee, but the former soon moved from the state and the latter was removed by death.

In the physical sciences, Dr. John E. Davies, of the state university, was at first perhaps the leading contributor, with Dr. J. H. Eaton, of Beloit, and Drs. R. Z. Mason and J. C. Foye, of Appleton, as almost equally active coworkers. Dr. Eaton was perhaps the only original member of the academy who had any notable academic training in technical research. A graduate of Amherst, he had won a Ph.D. at Göttingen by his researches on the compounds of manganese.

In the field of political economy and social science, at the outset, advancement was sought more by rational discussion than by rigorous determinations of basal data; and so there was more general participation in the discussions than in the more specific sciences. The most active leaders were President A. L. Chapin, of Beloit (chosen third president of the academy), President G. M. Steele, of Appleton, Superintendent Samuel Fallows, the Reverend Charles Caverno, Professor A. O. Wright, and later President John Bascom, Reverend Dr. Holland and others.

Though not active at the very outset, Dr. Wm. F. Allen, of the state university, soon began a memorable series of papers replete with specific historical research. These set a high standard of true original investigation in humanistic lines. From his scholarly papers some of us caught our first real-

izing sense of what constitutes original research in history.

Dr. Feuling, of the state university, was at the start a rather lonesome leader in philological research, but the fewness of workers in this line was offset by the quality of the papers offered.

An attempt was made to give speculative philosophy a distinct place in the work of the academy under the leadership of Dr. S. H. Carpenter, of the university, but the effort scarcely survived his early death.

Diversity and picturesqueness were given to the heavier parts of the program by the sprightly literary contributions of the imitable Dr. Butler.

EARLIER AND LATER TRENDS OF THE ACADEMY

As already noted, the formal organization of the academy was distinctly broad, and there was a general desire and a definite effort to preserve an appreciative and balanced attitude toward all phases of research and of culture. None the less almost inevitably distinct trends disclosed themselves almost from the start, and new trends appeared in close succession, partly due to the new men that came to the state, and partly to the development of young talent within it. Of the papers presented during the first two years, 35 per cent. related to geological subjects, 23 per cent. to biological, 17 per cent. to physical and mathematical science, 15 per cent. to political and sociological subjects, and the remaining 10 per cent. to historical and philological subjects or to topics not readily classified. A distinct geological trend at the outset is thus disclosed and the preponderance grew for a time. This special activity was due partly to charter members, particularly Lapham, Eaton and Chamberlin, but also, in a quite notable degree, to the advent of Professor R. D. Irving, who came to the state in the year following the founding of

the academy. He came with excellent training and the advantage of some field work, and at once took an active part in leading geological inquiry along sound scientific lines. Irving was chosen fourth president of the academy. Two years later a systematic Geological Survey was instituted by the state, largely through the influence of members of the academy, and this not only gave unusual opportunities for productivity in this line, but helped to develop young talent that made itself felt in the later activities of the academy.

Soon after the founding of the academy, the great movement toward a higher order of things in agricultural science and practise began and at first was most definitely represented by the chemical work of Professor W. W. Daniells. The developments in agriculture were more closely connected with the State Agricultural Society and particularly with the state university than with the academy, but the academy claims some little merit for this most signal development.

About the same time also Major Nicodemus and Captain Nader took the lead in developing interest in engineering themes by notable and stimulating discussions.

There has been occasion to lay emphasis on the type of study of plants and animals, most familiarly known as natural history, which prevailed at the founding of the academy and in the preceding pioneer stage. The career of the academy was scarcely more than under way before this began to give place to modern biological inquiries, and this led on to those important ecological and other studies that characterized the later official surveys and that mean so much to the intellectual and material welfare of the people of the state. This was perhaps the most notable change of trend in the intimate work of the academy. It was led by a young man who came to the

state in the fifth year of the academy and has given the academy one of its most prolonged and valued series of papers. Then a young man, we now delight to honor and revere him as president at once of the academy and of our state university, President Birge. A systematic phase in this modern departure was a little later admirably illustrated by the important contributions of Professor and Mrs. Peckham.

By the end of the first decade of the academy's life, it had undergone further changes and had taken on much more distinct diversity. It thus began the better to represent the varied intellectual development which the state was rapidly coming to enjoy, and which it has more fully realized in these later years.

By the end of the second decade the divergencies toward the later phases of the academy became still more marked. The distinctions of departments, that were rather formally defined at the outset, began to fade away, while the departments themselves grew more divergent. A more cosmopolitan spirit arose which made less of subjects and more of method and real intellectual advance. The formative period was being merged into what now seems to a founder "the Golden Era" of the academy. Doubtless intrinsically, it was no better than later stages—perhaps not so good—but these are the days of relativity and to one who felt the struggle and the weakness of the start, it seemed golden.

With it there came rapid changes in the personnel. The veteran naturalists passed away and other losses were many and grave. But the chief changes came from two other sources. The educational institutions of the state were rapidly developing in research lines and there came to the state many able men, well equipped and productive. It would be easy to begin the list—for there was Trelease and the lamented

Barnes—and to go on at length, but where could I end it? Besides, it is not my function to deploy the Golden Age of the academy, but merely its founding. The other source of change came even closer to the hearts of the founders, the coming of choice youth of the state into productive membership in the academy, the children of the academy. They were equally and perhaps more the children of the educational institutions of the state, but we claim them as children of the academy none the less. Very notable among these was President Van Hise, who rapidly rose to leadership in the state, in the nation and beyond. It would be a delight to name many others, but how could the parental affection of a founder permit him to stop short of naming all the children of the academy? The dilemma is in itself evidence that the formative stage of the academy had already passed away. The founding of the academy had really taken place.

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SCIENTIFIC EVENTS

AITOFF'S EQUAL-AREA PROJECTION OF THE SPHERE

A PROJECTION of the whole sphere on an equivalent or equal area system devised by

Aitoff, has just been issued by the U. S. Coast and Geodetic Survey, size 11 inches, price, 15 cents.

The sphere is represented within an ellipse with major axis twice the minor axis. No shoreline has been included since it is intended primarily for the plotting of the stars in astronomical work, its value for this kind of work being suggested by Professor Benjamin Boss, of the Dudley Observatory, Albany, N. Y.

The projection is bounded by an ellipse similar to that which is used in Mollweide's equal area projection but, since the parallels are curved lines, the distortion in the polar regions is less in evidence. The net-work of meridians and parallels is obtained by the orthogonal or perpendicular projection of a Lambert meridional equal area hemisphere upon a plane making an angle of 60° to the plane of the original.

The fact that it is an equivalent or equal area projection combined with the fact that the celestial sphere is represented in one continuous map, will show at a glance the relative frequency of stars in the different regions of the expanse of the heavens. As constructed the radius of the sphere to be projected is taken as a decimeter so that the graticule has a very convenient size for general use.

As used for a map of the world, this projection is well adapted to replace the Mercator

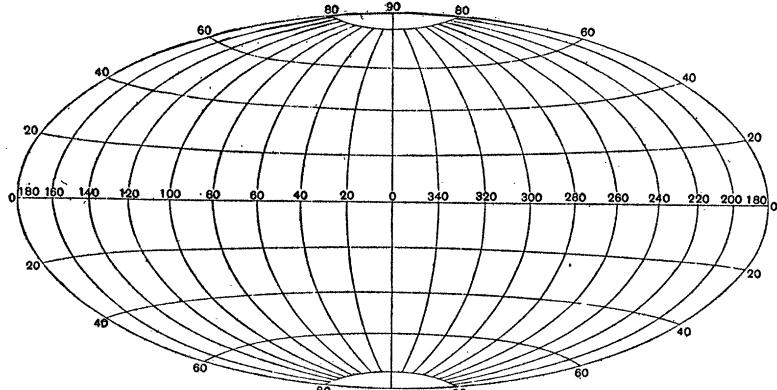


FIG. 1.